

Abstract

Systems and methods for measuring the flow of a fluid along a passageway are disclosed. A heat source applies thermal energy to a portion of the fluid thereby elevating its temperature and decreasing its density. An optical sensing means measures a change in a property of illumination directed through the passageway caused by the change in the density of the heated portion of fluid. The time required for the heated portion of the liquid to move from the point of application of thermal energy to the point of optical sensing is measured. This measured time, and the distance of separation of the source of heat and the optical sensor permits calculation of the fluid velocity in the passageway.